

REMARKS

Applicants thank Examiner for his allowance of claims 1 and 2. Applicants respectfully point out that three claims are pending in this application. Original claim 3 has not been canceled, but was omitted from the office action. Applicants request allowance of claim 3.

**Claim Objections**

Claims 1 and 2 have been objected to for not clearly defining the variables. Applicants respectfully point out that the variables are defined in both the claims and the specification. In particular, claim 1 includes two variables,  $m$  and  $n$ . The variable  $m$  is defined in claim 1 as the number of bits in a lower order gain control signal. *See e.g.* page 14, line 14. This definition is consistent with the specification. *See e.g.* page 5, lines 24-26. The variable  $n$  is defined in claim 2 as number of bits in a higher order gain control signal. *See e.g.* page 14, line 17. This definition is also consistent with the specification. *See e.g.* page 5, lines 24-26.

Claim 2 includes the following variables:  $m$ ,  $n$ ,  $x$ ,  $y$ ,  $C$ ,  $C_s$ ,  $C_f$ ,  $p$ ,  $q$ ,  $G$ , *Code*,  $A$ , and  $B$ . The variables  $m$  and  $n$  are defined the same as with respect to claim 1. The variable  $x$  represents the decimal number notation of the control data of higher order  $n$  bits. *See e.g.* page 15, lines 20-21 and page 6, lines 34-35. The variable  $y$  represents the decimal number notation of the control data of lower order  $m$  bits. *See e.g.* page 15, lines 21-22 and page 6, lines 35-36. Claim 2 defines  $C$  as standing for one unit capacitance of the capacitor string. *See e.g.* page 15, line 14. The variable  $C_s$  is defined in claim 2 and the specification as the capacitance of the input fixed capacitor and is equal to:  $(A \cdot C)$ . *See e.g.* page 15, lines 14-15 and page 5, lines 27-30. The variable  $C_f$  is defined in claim 2 and the specification as the capacitance of the feedback loop fixed capacitor and is equal to:  $(B \cdot C)$ . *See e.g.* page 15, lines 15-16 and page 5, 30-32.

As stated in claim 2, the coefficients  $p$  and  $q$  are used in approximating gain control characteristics to approximate Linear-in-db characteristics. *See e.g.* page 15, lines 23-26. They are represented by formulas (5) and (6) on page 6, lines 7-8 and 10-11 respectively:

$$p = A \cdot (2^{2m+n} \cdot G_{mid} \cdot G_{max} + (2^{2m+n} - 2^{1+m}) \cdot G_{mid} \cdot G_{min} - (2^{1+2m+n} - 2^{1+m}) \cdot G_{max} \cdot G_{min}) / (G_{min} \cdot (G_{mid} - G_{max}) \cdot (-4^{m+n} + 32^{m+n} - 2));$$

$$q = A \cdot (2^{2m+n} \cdot G_{min} - 2^{2m+n+1} \cdot G_{mid} + 2^{2m+n} \cdot G_{max} + 2^{1+m} \cdot G_{mid} - 2^{1+m} \cdot G_{max}) / (G_{min} \cdot (G_{mid} - G_{max}) \cdot (-4^{m+n} + 32^{m+n} - 2)).$$

The variable  $G$  represents a gain associated with the gain control signal *Code*. The formula defining  $G$  is found both in claim 2, page 15, line 31 and in formula (7) on page 6, line

16 of the specification:  $G = (2^m \cdot Cs/p + Code \cdot C) / (2^m \cdot Cf/p + (2^{m+n} - 1 - q \cdot Code) \cdot C/p)$ . The variable *Code* is the decimal number notation for the gain control signal. The formula defining *Code* is found both in claim 2, page 15, line 22 and in formula (9) on page 7, line 2 of the specification:  $Code = 2^m \cdot x + y$ .

The remaining variables *A* and *B* are defined generally in claim 2 as coefficients for determining capacitance. *See e.g.* page 15, lines 14-16. Formula (3) on page 5, line 35 and formula (4) on page 5, line 37 in the specification further define *A* and *B*, respectively, as follows:

$$A = G_{min} \cdot (G_{max} + 1) \cdot (2^{-m} \cdot 2^n) / (G_{min} - G_{max});$$

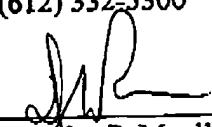
$$B = (2^{-m} \cdot 2^n) \cdot (G_{min} + 1) / (G_{min} - G_{max}).$$

Claim 2 further includes the terms *Gmax*, *Gmin*, *Gmid*. Even if *Gmax*, *Gmin*, and *Gmid* can be considered variables, a point that applicants do not concede, they are defined in claim 2 and the specification. *Gmax* is the maximum value of a gain that can be controlled with a control signal of  $(m+n)$  bits. *See e.g.* page 15, lines 17 and page 5, lines 24-27. *Gmin* is the minimum value of a gain that can be controlled with a control signal of  $(m+n)$  bits. *See e.g. id.* *Gmid* is an intermediate value of a gain controlled with the gain control signal of  $(m+n)$  bits. *See e.g.* page 15, lines 18-20 and page 6, lines 1-2.

If the Examiner believes a telephone conference would be helpful, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

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